

WHAT IS CLAIMED IS:

1. A mechanism simulation method of performing  
a mechanism simulation using both a dynamics simulation  
and a kinematic simulation, wherein in the dynamics  
5 simulation, a behavior of a mechanism is simulated  
using a dynamics model including a continuous system  
equation having a plurality of variables, and in the  
kinematic simulation, a geometrical operation of the  
mechanism is simulated using a three-dimensional  
10 mechanism model including a plurality of mechanism  
elements, the method comprising:

calculating a value of one of the variables of the  
continuous system equation by a first simulator that  
executes the dynamics simulation;

15 identifying a mechanism element corresponding to  
a variable having the calculated value, referring to  
a table that represents a correspondence between the  
variables and the mechanism elements;

transmitting, to a second simulator, information  
20 specifying the identified mechanism element and the  
calculated value of the variable; and

executing the kinematic simulation by the second  
simulator based on the information.

2. A mechanism simulation method according to  
25 claim 1, wherein the dynamics model includes a hybrid  
model comprising a continuous system model and a state  
transition model, and the dynamics simulation includes

a hybrid simulation.

3. A mechanism simulation method according to claim 1, wherein the state transition model inputs a control signal from an external mechanism control software system.

4. A mechanism simulation method according to claim 1, wherein the mechanism elements include a rotation angle or displacement of an actuator.

5. A mechanism simulation method according to claim 1, further comprising:

reading data representing the variables of the dynamics model;

reading data representing the mechanism elements of the three-dimensional mechanism model;

extracting, from the data representing the variables, a plurality of selective variables each of which enables to be associated with any one of the mechanism elements;

extracting, from the data representing the mechanism elements, a plurality of selective mechanism elements each of which enables to be associated with any one of the variables; and

receiving a selection which is made by a user and is indicative of a combination of one of the plurality of selective variables and one of the plurality of selective mechanism elements, to generate the table based on the selection.

6. A mechanism simulation method according to claim 5, wherein the one of the plurality of selective variables in the combination is selected by:

5 selecting a class to which the selective variables belong, and

selecting a member variable in the class.

7. A mechanism simulation method according to claim 5, wherein data of the dynamics model includes a description data described in a hybrid model language.

10 8. A mechanism simulation method according to claim 5, further comprising storing the generated table to a file.

9. A computer program stored in a computer readable medium for performing a mechanism simulation  
15 using both a dynamics simulation and a kinematic simulation, wherein in the dynamics simulation, a behavior of a mechanism is simulated using a dynamics model including a continuous system equation having a plurality of variables, and in the kinematic  
20 simulation, a geometrical operation of the mechanism is simulated using a three-dimensional mechanism model including a plurality of mechanism elements, the program comprising:

25 means for instructing a computer to calculate a value of one of the variables of the continuous system equation by a first simulator that executes the dynamics simulation;

means for instructing the computer to identify  
a mechanism element corresponding to a variable having  
the calculated value, referring to a table that  
represents a correspondence between the variables and  
5 the mechanism elements;

means for instructing the computer to transmit,  
to a second simulator, information specifying the  
identified mechanism element and the calculated value  
of the variable; and

10 means for instructing the computer to execute the  
kinematic simulation by the second simulator based on  
the information.

10. A computer program according to claim 9,  
wherein the dynamics model includes a hybrid model  
15 comprising a continuous system model and a state  
transition model, and the dynamics simulation includes  
a hybrid simulation.

11. A computer program according to claim 9,  
wherein the state transition model inputs a control  
20 signal from an external mechanism control software  
system.

12. A computer program according to claim 9,  
wherein the mechanism elements include a rotation angle  
or displacement of an actuator.

25 13. A computer program according to claim 9,  
further comprising:

means for instructing the computer to read data

representing the variables of the dynamics model;

means for instructing the computer to read data representing the mechanism elements of the three-dimensional mechanism model;

5 means for instructing the computer to extract, from the data representing the variables, a plurality of selective variables each of which enables to be associated with any one of the mechanism elements;

means for instructing the computer to extract,  
10 from the data representing the mechanism elements, a plurality of selective mechanism elements each of which enables to be associated with any one of the variables; and

means for instructing the computer to receive  
15 a selection which is made by a user and indicative of a combination of one of the plurality of selective variables and one of the plurality of selective mechanism elements, to generate the table based on the selection.

20 14. A computer program according to claim 13, further comprising:

means for instructing the computer to select a class to which the selective variables belong, and

means for instructing the computer to select  
25 a member variable in the class, thereby selecting the one of the plurality of selective variables in the combination.

15. A computer program according to claim 13,  
wherein data of the dynamics model includes a  
description data described in a hybrid model language.

16. A computer program according to claim 13,  
5 further comprising means for instructing the computer  
to store the generated table to a file.